

Fractures of Distal Humerus Operated with Using Lambda Plate

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ABSTRACT

Background: The goal of this study to determine functional outcome of open reduction and internal fixation with Lambda plate for intra/extra articular distal humerus fractures. **Methods:** 35 patients of comminuted intra-articular fractures distal humerus were operated. Out of 35, 23 (65%) were male, 12 (35%) were female, mean age of 38 year (range 17-67 years). According to classification proposed by Riseborough and Radin based on radiographic analysis, out of 35, 11 (31%) were type 2, 20 (57%) were type 3 and rest of the patients were type 4 fractures. All fractures fixed with Lambda plate, intercondylar fracture fix with malleolar screw or k-wire or both after trans olecranon osteotomy.

Results: Mean follow-up of 11 months (range 6-15 months). Out of 35 patients 29 patients have complete radio-logical union within 4 months. None of the fracture go into non-union.

Mean active elbow flexion was 130° (range 90°-140°) and active extension 15° (range 0-30°), mean elbow flexion range exceeds 100 degree in 28 patients (80%), was between 60° and 100° in 6 (17%) and was less than 60° in one patient. Mean Mayo Elbow Performance Score (MEPS) was 96 points (range 40-100). There were 30 excellent result (MEPS) 90-100 points, 2 good (75-89) 2 moderate result. **Conclusion:** Fracture of distal humerus fix with Lambda plate, malleolar screw after trans-olecranon osteotomy gave excellent results in term of fixation, stability and recovery of elbow functions.

Keywords: Fracture, Distal Humerus, Plate.

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INTRODUCTION

Fracture of distal humerus accounts for approximately 16% of total humerus fractures and 3% of all fractures in adults.^[1] These fractures are difficult to manage because of involvement of articular surface, comminution and osteoporotic bone in old age.^[2] Various methods are described for management of such type of fractures.^[3] The main goal of our treatment is to achieve good anatomical reduction, stable fixation and good functional outcome at elbow and shoulder joint. Extra articular distal humerus Lambda plate (EADHP) are available for treating these types of fractures that's provide stable fixation and allow early mobilization.^[4] We conduct retrospective study to access functional and radiological outcome and complication in the patient of fracture distal humerus fix with EADHP, malleolar screw after trans-olecranon osteotomy.

METHODS

We follow Riseborough and Radin classification (based on Radiographic analysis).

TYPE 1. Undisplaced fractures extending between capitulum and trochlea.

TYPE 2. Displaced T or Y fracture without rotation of condyles.

TYPE 3. T or Y fractures with rotational displacement of condyles.

TYPE 4. Severe comminution of articular surface and wide separation of condyles.

35 patients of fracture distal humerus were operated. All patients were operated with Lambda plate, malleolar screw or

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K-wire or both for intra-articular fixation after trans-olecranon osteotomy.

Out of 35 patients 23(65%) were male, 12 (35%) were female, mean age 38 years with average follow up of 11 months.

According to Risebrough and Radin classification, 11 patients out of 35 (31%) were type 2, 20 patients were type 3 (57%) and rest of the patients were type 4.

SURGICAL TECHNIQUE

We use compbell's posterior trans-olecranon approach that allow good exposure of all articular surface and fracture fragments with minimum damage to soft tissue.^[5] Trans-olecranon osteotomy performs about 2cm from tip of olecranon, $\frac{3}{4}$ th of olecranon cut with oscillating saw and remaining $\frac{1}{4}$ th with osteotome. Expose the ulnar nerve safely.

Reduce the inter-condylar fragments and hold with clamp and fix with malleolar screw or K-wire or both. Then reduce extra articular fracture hold with clamp and fix with 3.5 mm Lambda plate. Fix the olecranon with 4.5mm screw or with TBW.

POSTOPREATIVE COURSE:-

Elbow mobilization allow after 4 weeks in younger patient and at 6 weeks in over 60 year of age group. Both radiological and systematically follow-up at regular interval.

ASSESSMENT METHOD:-

We access the patient both clinically and radiologically at a regular interval, to access union or any deformity, functional recovery was access by range of motion at elbow and functional assessment by using Mayo Elbow performance score (M.E.P.S.).

RESULTS

1. Henley reported 75% good/ excellent result in 33 cases of inter-condylar fractures.
2. Letsch et al. obtained 81% good in 104 cases of inter-condylar fractures with open reduction and internal fixation.
3. Galbel et al. obtained 90% good/ excellent result in 10 caes with dual contoured plate.
4. Helpel & schmeling noted 75% good to excellent result after open reduction and internal fixation.

Mean follow up was 11 months (range 6-15 months). There were no case of infection, non-union of olecranon osteotomy, ulnar nerve injury and none of the patient require further surgery for any complication.

3 Patients had mild residual pain. Mean active elbow flexion was 130° (90° - 140°) and active extension 15° (-30° to 0°), mean flexion exceed 100° in 28 patients (80%) and was between 60° - 100° in 6 (17%) mean MEPS was 98 points. There were 30 excellent result in 85% of patients, good result in 2 patients and moderate in 2 patient, poor result in 1 case. Radio-logically union without complication found in 97% cases. None of the patient found non-union.

DISCUSSION

Fracture of distal humerus with articular involvement are difficult to treat. With posterior approach and trans-olecranon osteotomy intra-articular involvement of such fracture are well exposed leads to good anatomic reduction of fracture fragments. The shape of Lambda plate is well adapted to shape of distal humerus provide stable fixation and allow early mobilization of elbow, lead to good functional recovery.^[4] For intra-articular fractures malleolar screw or molleolar-screw and k-wire use for fixation. For fixation of Lambda plate at least two screw should be used for each arm.^[3] In our series, mean elbow flexion was exceed 100° in 28 cases (80%) between 60° to 100° in 6 patients (17%) and less than 60° in one patients.

Excellent result (M.E.P.S. 90-100) in 30 patients. Good result (M.E.P.S. 75-89) in 2 patients and poor result in one patient. Radiologically fracture unite in all patients, none of the fracture go into non-union.^[5,6] Ulnar nerve injury not found in any case.

CONCLUSION

Fracture of distal humerus treating with Lambda plate gave excellent results regarding functional recovery of patients. Lambda plate can be used for Risebrough and Radin type 4 fractures.

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